Imperial Agricultural Bureaux

Eighteenth Annual Report

OF THE

Executive Council

1946-1947

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1948

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IMPERIAL AGRICULTURAL BUREAUX

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(March 1948)

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PREFACE

The Imperial Agricultural Research Conference*, 1927, stressed (*a*) the need for scientists to be in touch with the progress of research throughout the world in their several branches, and (*b*) the difficulty therein owing to the great output of scientific literature and the diversity of languages in which it is published.

2. It recommended the Governments of the British Commonwealth to establish on a joint co-operative basis eight bureaux to collect, collate and disseminate information on research in eight selected branches of agricultural science and generally to assist research workers in the Commonwealth and Empire with information relevant to their subjects. Each bureau was to be located at a research Institute specializing in its own branch of science so that the bureau officers should be in daily contact with men engaged on research in its own subject. These bureaux were to be financed from a common fund contributed by Commonwealth Governments in agreed proportions and controlled by a Council composed of representatives of those governments on an equal footing.

3. Governments accepted these proposals. In November, 1928, a new type of inter-Imperial co-operative agency acceptable to all governments was worked out in detail. On 1st April, 1929, the Executive Council of the Imperial Agricultural Bureaux came into being. The eight bureaux started work in that year.

4. Following the Ottawa Conference of 1932, the work of several inter-Imperial agencies was examined and reported upon by the Imperial Committee on Economic Consultation and Co-operation (1933). This Committee approved of the bureaux organisation and of its work, and extended the duties of the Council, *inter alia* proposing that with effect from 1st October, 1933, it should also be responsible for the supervision and administration and finance of the Imperial Institute of Entomology and of the Imperial Mycological Institute.

5. It also enunciated certain general principles to be observed in regard to the organisation of agencies for inter-Imperial co-operation and consultation, e.g., constitutional equality of participating governments in the appointment of the authority administering the work; the provision of adequate finance for a definite period of years; careful and periodical examination of the work and organisation of the agency at commonwealth conferences suitable for the purpose, as without that assurance governments could hardly be expected to provide the adequate continuing finance; responsibility of the administering authority to all participating governments. All Governments accepted this report.

6. The British Commonwealth Scientific Conference (1936) conducted the first of these "periodical examinations." It approved both the work and organisation. It recommended the finance necessary until 1941–42 (extended later to cover the war period), its distribution between governments, also the formation of two more bureaux, and certain modifications in practice designed to improve general efficiency. Governments accepted these proposals.

7. A Review Conference was held in the summer of 1946 just one year after the close of the war. This was the first since 1936 and was only the second "periodical examination" since the recommendations of the Imperial Committee on Economic Consultation and Co-operation in 1933. Here it may be recorded that the Review Conference recommended that the Parasite Service should continue to be located at Belleville, Canada, that it should become an individual bureau and that its name should be changed to the Bureau of Biological Control to denote its separate entity. It also decided that information on general husbandry should be provided within the framework of the existing bureaux which, in turn, necessitated the name of the Bureau of Pastures and Forage Crops being altered to Pastures and Field Crops. Both changes of name were made the day after the close of the year under report, 1st April, 1947, which coincided with the opening date of the new review period when the recommendations of the conference officially came into force.

8. The organisations under the administration of the Executive Council are :—

The Imperial Institute of Entomology.
The Imperial Mycological Institute and the

* From January 1, 1948, the name of the organisation was changed to Commonwealth Agricultural Bureaux.

As a measure for paper economy, the usual list of publications has been omitted from this report. Copies of the 1948 list are, however, available for those desirous of consulting them, and will be supplied on application to:
The Commonwealth Agricultural Bureau, Central Sales Branch,
Agricultural Research Building, Penglais, Aberystwyth, Wales.
or to the Secretary, Commonwealth Agricultural Bureaux,
2, Queen Anne's Gate Buildings, Dartmouth Street, London, S.W.1.

Imperial Bureaux of—

Soil Science.
Animal Health.
Animal Nutrition.
Animal Breeding and Genetics.
Plant Breeding and Genetics.
Pastures and Field Crops.
Horticulture and Plantation Crops.
Agricultural Parasitology (Helminthology).
Dairy Science.
Forestry.
Biological Control.

The Potato Collection.

9. A "Liaison" officer appointed by the appropriate department in each participating country keeps in touch with administrative matters, and in each country for each bureau a scientific officer is nominated as Official Correspondent to be the "general friend" on scientific matters of that bureau in that country. The Heads of the several Institutes at which bureaux are located act as Consultant Directors of the bureaux, thus giving the Council and bureaux the benefit of their wide experience and scientific knowledge. All other officers are whole-time servants of the Executive Council.

REPORT

At its meeting on the 31st March, 1948, the Executive Council of the Commonwealth Agricultural Bureaux adopted the following report on its 18th year of work—1st April, 1946 to 31st March, 1947.

2. Adaptation to post-war conditions continued during the year despite the difficulties of getting sufficient trained staff, rising prices, paper shortage, coal shortage, the abnormal winter and the arrears caused by the war.

The Review Conference of 1946

3. The most important event of the year was the Review Conference. A general account of the preliminaries leading to this conference was given in paragraph 3 of the Annual Report for 1945–46 and need not be repeated here. The Conference of the Royal Society and the British Commonwealth Official Scientific Conference immediately preceded this Review Conference and many members of the delegations to the Review Conference were delegates to the other two. The Review Conference was opened on June 18th, 1946, by the Right Hon. the Earl of Huntingdon, Parliamentary Secretary to the Ministry of Agriculture and Fisheries of the United Kingdom. June 2nd to July 19th were mainly occupied by meetings of the Royal Society and Scientific Conferences though the bureaux at Oxford and Cambridge and the South American Potato Collection were visited during this period.

At the same time from the 1st to 8th July, 1946, delegates who were not engaged with the Royal Society and Official Scientific Conferences made tours of inspection to institutes and bureaux in and near London.

4. The first plenary meeting of the Review Conference took place on July 22nd. Committee meetings occupied the time from then until July 25th and on July 26th the final plenary meeting and consideration of the resolutions took place.

Many delegates made further visits to bureaux after the close of the conference and in the week just before and that just following the Review Conference several delegates attended discussions on particular scientific subjects in which they were interested and which were arranged by United Kingdom departments or by scientists at the universities visited. The full report of the proceedings was presented to Parliament by command of His Majesty in November, 1946 as Command Paper 6971.

5. Although the new Review Conference period formally starts from April 1st, 1947, a number of preliminary steps have been taken on recommendations which did not involve expenditure during the current year under report. The report of the action taken on these recommendations belongs to later years. All that need be done in this report is to refer to that preliminary action.

B.C.S.O., London

6. As recommended the Executive Council kept in close touch with all arrangements for housing the British Commonwealth of Nations Scientific Liaison Offices in London. The first preliminary steps were taken in September, 1946 but by the close of the year nothing had been settled as no accommodation had been found.

Filling of Posts

7. All preliminaries were taken to fill the posts mentioned in paragraph 77 of the Review Conference Report and a number of appointments were made soon after the close of the year. These will be reported next year.

Plant Expeditions Committee

8. A temporary Plant Expeditions Committee was set up before the close of the year to deal with current work. It consisted of the Secretary to the Executive Council *ex officio*, the Directors of the Bureaux of Plant Breeding and Genetics, Pastures and Field Crops and Horticulture and Plantation Crops with Mr. R. H. Richens, M.A., the Assistant Director of the Bureau of Plant Breeding and Genetics, acting as Secretary to the temporary Plant Expeditions Committee.

Food and Agriculture Organisation

9. Relations with F.A.O. continued to be cordial. Though treated from a somewhat different angle the general fields covered by F.A.O. and C.A.B. are very similar and close liaison is desirable both to assist each other and to prevent duplication of work. It is not the policy of F.A.O. to enter

directly the field of abstracting. But while abstracts are the basic method by which C.A.B. fulfils its function of disseminating information, abstracts are not the only method. Duplication and overlap are always possible in matters like Technical Communications and more than one example has arisen where the possibility of duplication of effort has occurred. The Executive Council keeps this continually in view and after the close of the year steps were taken for even closer collaboration.

10. Dr. Leitch, Director of the Bureau of Animal Nutrition, was appointed a member of the F.A.O. Standing Committee on Nutrition. These Standing Committees are composed of experts in particular subjects who meet periodically to discuss the general work and programmes of the particular sections of F.A.O. to which they refer.

A meeting of the Standing Committee on Nutrition took place during the year in Copenhagen and later there was a Committee in Washington on Caloric Conversion and Food Composition Tables which Dr. Leitch also attended. The expenses connected with these visits were borne by F.A.O.

Certain extracts from F.A.O. publications are reproduced as Appendix I to this report.

Specialist Conferences

11. The Review Conference in paragraph 134 of the Report recommended that the Executive Council generally encourage specialist conferences and in paragraph 136 specifically recommended the early resumption of the Commonwealth Entomological and Mycological conferences. During the year Council approved that three specialist conferences should be held in London during the summer of 1948, namely—

The Fifth Entomological Conference,
,, Fourth Mycological Conference and
,, Tropical Soils Conference.

Changes in Personnel, in the Executive Council and in the Institutes and Bureaux

12. In March 1946 Lt.-Colonel J. G. Robertson, the representative of Canada, was elected Chairman of the Executive Council and in May 1946 Sir Patrick R. Laird, C.B., F.R.S.E., the representative of the United Kingdom, was elected Vice-Chairman.

During the year under review there were numerous changes in Council. The nomination of Mr. C. Y. Carstairs (Colonies, Protectorates and Mandated Territories), Mr. M. K. Vellodi, C.I.E. (India) and Sir Patrick R. Laird, C.B., F.R.S.E. (United Kingdom) were recorded in the previous report.

In November 1946 Mr. G. A. Holmes, M.Sc., B. Agric., was nominated by the Government of New Zealand and Colonel W. F. Rendell, C.B.E., by the Government of Newfoundland. In February 1947 Mr. J. G. Hibbert, M.C., succeeded Mr. C. Y. Carstairs. For most of the year Captain I. H. Morten, R. N., deputised for Mr. T. G. Gisborne (Southern Rhodesia) and Mr. W. B. England, M.B.E., for Mr. Vellodi, C.I.E. (India).

13. In August Sir David Chadwick, K.C.M.G., C.S.I., C.I.E., resigned from the office of Secretary to the Executive Council after having held that office since the inception of the organisation in 1929. It was largely by Sir David Chadwick's ability and enthusiasm that the organisation was built up and developed and achieved the success that it has. Though there was some dislocation in the early years of the war, reflected in decreased sales, the decrease was remarkably small, under 20 per cent. By 1943–44 pre-war sales had been overtaken and continued to increase satisfactorily. Only Sir David really knows what this remarkable result must have cost him and the staff. The Executive Council wishes to place on record its great appreciation of Sir David Chadwick's services and feels sure that his many friends and admirers throughout the Commonwealth and Empire will join in wishing Sir David and Lady Chadwick every happiness in the future. Though Sir David's resignation dated from the beginning of August he continued to advise his successor until the end of January 1947. Even though his official connection with the organisation ceased at the end of January his unofficial connection still continues and it is the wish of everybody that it may continue indefinitely.

In June Sir Herbert Howard, formerly Inspector General of Forests to the Government of India, was appointed Secretary designate and in August took over from Sir David Chadwick.

14. Changes also occurred among senior officers in the Institutes and bureaux. Sheffield A. Neave, C.M.G., O.B.E., M.A., D.Sc., Director of the Institute of Entomology, retired on July 31, 1946, after 33 years service. A tribute to his work will be found in paragraph 26 of the Review Conference Report 1946. The success of the Institute was largely due to Dr. Neave's ability and guidance. Dr. Neave was succeeded by W. J. Hall, M.C., D.Sc.

Two appointments were made in April 1947 at the Mycological Institute—Miss G. M. Waterhouse

was appointed sub-editor and Mr. M. B. Ellis, B.Sc., Assistant Mycologist.

In September Professor R. T. Leiper, C.M.G., M.D., D.Sc., F.R.S., F.R.C.P., Consultant Director to the Bureau of Agricultural Parasitology (Helminthology) resigned and shortly afterwards was appointed Director of the bureau.

J. E. Nichols, M.Sc., Ph.D., F.R.S.E., Director of the Bureau of Animal Breeding and Genetics, resigned on his appointment to a professorship at the University College of Wales at Aberystwyth. Mr. I. L. Mason, B.A., Scientific Assistant at the bureau was appointed acting Director pending the appointment of a Director.

Mr. R. H. Richens, Scientific Assistant at the Bureau of Plant Breeding and Genetics, was promoted Assistant Director.

At the Commonwealth Potato Collection, Cambridge, Miss M. A. Keay, M.A., Ph.D., was appointed as mycologist.

Establishment

15. In May 1946 Council agreed that as a general principle there should be at least one second officer in each bureau with scientific qualifications sufficient to enable him to assist the Director and to carry on work for a time in his absence. The Review Conference of 1946 approved this principle in paragraph 28 when it urged the Executive Council to arrange the staffing of the bureaux so that Directors are not unduly occupied in routine abstracting. Funds, therefore, were provided for an Assistant Director in each bureau.

16. During the year applications were invited for the positions of Director of the Bureau of Animal Breeding and Genetics and of the Forestry Bureau. Neither post had been filled at the close of the year under review. Both were filled shortly after but this will be reported in the 1947–48 annual report.

17. During the year applications were invited for the posts of Assistant Director at the Bureaux of—

Soil Science,
Pastures and Field Crops,
Horticulture and Plantation Crops,
Dairy Science.

None of the posts was actually filled before the close of the year.

Overseas Visits by Senior Staff

18. During the current year overseas and foreign visits have been more numerous than during the preceding year.

Early in the year Dr. Wiltshire, Director of the Mycological Institute, visited Leiden University, Holland. This was followed by a visit to Leiden by Mr. Mason, the Senior Mycologist of the Institute, to work over specimens of Hyphomycetes in the Persoon Herbarium. The visit to Malta arranged for Dr. Bisby of the same Institute had to be deferred owing to transport difficulties.

At the invitation of U.N.R.R.A. Dr. P. S. Hudson, Director of the Bureau of Plant Breeding and Genetics, made three visits to Italy and neighbouring countries. The visits lasted for 6 months, 3½ months and 2 months respectively and the termination of the last visit coincided with the closing down of U.N.R.R.A., in March 1947. As a result of these visits Dr. Hudson established valuable relations with scientists and scientific institutions abroad and was able to secure literature of importance to bureaux work. The expenses of these visits were borne by U.N.R.R.A.

At the invitation of the International Grassland Organisation Dr. R. O. Whyte, Director of the Bureau of Pastures and Field Crops, went to Zurich in connection with the British Grassland Society taking over records of the central office. Dr. Whyte established valuable relations with Swiss workers in his own field. Half the expenses of this visit was borne by the British Grassland Society.

As reported in a previous paragraph Dr. I. Leitch, Director of the Bureau of Animal Nutrition, visited Copenhagen to attend a meeting of the F.A.O. Standing Advisory Committee on Nutrition and in February 1947 went to Washington to attend the F.A.O. Committee on Calory Conversion and Food Composition Tables. The expenses of these visits were borne by F.A.O.

On a request from the Dominions Office Miss T. C. Russell, Scientific Assistant at the Bureau of Animal Nutrition, was seconded for one year to Newfoundland as an adviser and planner to the local nutrition council in the Department of Public Health and Welfare, Newfoundland. She left in October and had not returned by the end of the year.

Dr. J. G. Hawkes (Potato Collection) made two separate visits to the continent of Europe in connection with the taxonomy of the potato. Various parts of Germany were visited in April and France in October and November. (See Appendix IV.)

Dr. W. R. S. Wortley (Potato Collection) attended the fourth International Congress of Microbiology at Copenhagen in July.

Visits to Bureaux by Overseas Scientists

19. Arising out of the recommendation in

paragraph 73 of the Hankey Report of 1943, the Government of India deputed Dr. G. Sankaran, Professor of Biochemistry and Nutrition, all-India Institute of Hygiene and Public Health, Calcutta, and Dr. K. Mitra, Deputy Director of Rationing (Nutrition), Government of India Department of Food, to work for one year at the Bureau of Animal Nutrition. Dr. Sankaran arrived in April and Dr. Mitra in October.

In addition to work at the bureau both these gentlemen made many visits to industrial centres of food production and processing and public health organisations, communal feeding centres, educational establishments etc. This has been profitable both to the officers in India and to the bureau in establishing a link between the various centres.

General

20. It was said in paragraph 18 of the report for 1945–46 that the bureaux organisation was more widely known at the end of the war than previously. That remark can be made with even more truth this year. Perhaps the best direct measure of such knowledge is the value of sales which reflect circulation. That is dealt with in paragraph 22.

21. What must be reported here is that it is already apparent before the opening date of the new period that the financial provision for the coming five years is inadequate. It is not yet clear how inadequate it is likely to be but it is already perfectly clear that the sum provided for printing etc. is far too low. The estimates for the first year of the coming period were received before the close of this year and already show an increase in expenditure on publications of more than 50 per cent. above the amount provided. While such estimates are seldom exact this very large rise is greater than any likely error in estimating. Provided income from sales rises as quickly all will be well but if the receipts from these sales are not received during the same year there is bound to be difficulty. This large rise above the Review Conference estimates is mostly caused by an increase in the amount produced and only partly by increased rates. This is a healthy activity since the dissemination of information is the reason why the organisation was established. If this activity in publication grows greater during the period, as it certainly should do with the increased staff provided, then the financial position on this score alone may give rise to serious though temporary shortage. Apart from the increased activity in publication the amount provided was generally too low because rates for staff, especially below the scale of assistant director, have risen quite appreciably since the conference.

PUBLICATIONS

22. While the bureaux could not escape and could not expect to escape the restrictions placed on the use of paper as a result of the war and the fuel shortage, the character of the publications, and especially of the abstract journals, has resulted in most considerate treatment by the Paper Control. It has been possible, so far, to meet most current demands though the curtailed wartime issues have resulted in a depletion of stocks which will necessitate the reproduction of some issues in the near future.

23. The usual statement of the receipts from sales of publications over a seven-year period is as follows :—

Receipts from Sales of Publications

	1940–41	1941–42	1942–43	1943–44	1944–45	1945–46	1946–47
	£	£	£	£	£	£	£
Imperial Institute of Entomology ..	1,798	1,885	1,692	2,236	2,811	4,018	5,069
Imperial Mycological Institute	670	843	799	1,333	1,616	2,166	2,802
The Bureaux, including Nutrition Abstracts and Reviews	5,247	6,443	5,468	6,607	8,750	11,305	14,874
	7,715	9,171	7,959	10,176	13,177	17,489	22,745

The figures for the several bureaux are:—

	1940–41	1941–42	1942–43	1943–44	1944–45	1945–46	1946–47
	£	£	£	£	£	£	£
Soil Science	358	399	308	372	471	661	1,482
Animal Health	1,084	1,174	1,219	1,474	1,688	2,291	3,172
Animal Nutrition	29	50	45	38	82	131	113
Animal Breeding and Genetics	227	188	232	305	528	874	901
Horticulture and Plantation Crops	286	417	308	412	794	887	1,245
Pastures and Field Crops	422	348	250	336	688	1,032	1,132
Plant Breeding and Genetics	320	334	240	342	531	686	1,178
Agricultural Parasitology (Helminthology)	224	198	236	247	329	318	570
Dairy Science	283	270	300	323	378	636	708
Forestry	195	237	229	236	270	444	726
Headquarters	22	16	7	5	13	11	13
Total	3,450	3,631	3,374	4,090	5,772	7,971	11,240
Nutrition Abstracts and Reviews	1,797	2,057	2,098	2,501	2,951	3,318	3,606
5-year Index	—	755	4	16	27	16	28
	5,247	6,443	5,468	6,607	8,750	11,305	14,874

With the exception of the year 1942–43, this table records a progressive increase of receipts from sales. The figure shown in the fourth column, that for 1943–44 (£10,176), is higher than for any pre-war year and the steady increase since that year is due to the general increased demand for the publications of both institutes and all the bureaux.

24. The above figures relate to sales and audited receipts and take no account of copies distributed free. Journals to the value of £3,253 are sent under the quota system free to Commonwealth countries. In the spring of 1947 the regular mailing list for the journals was as follows :—

	Numbers			
	Free "Quota"	Free, almost entirely exchange	Subscribers	Total
Countries of the British Commonwealth and Anglo-Egyptian Sudan	2,378	357	3,824	6,559
Foreign Countries		686	4,065	4,751
Total	2,378	1,043	7,889	11,310

25. Appreciation of the reliability of the scientific information recorded in the abstract journals is frequently received, but, despite the encouraging increase of sales, the Executive Council is of opinion that the journals still do not reach nearly as wide a circle of scientific workers nor are read as widely as the usefulness of these publications would justify. The Council appreciates that the present relatively small circulation may be in part due to the cost of the journals. The Review Conference report, in paragraph 33, recommended that the Executive Council should consider a revision of prices. At the same time it was to consider whether by standing orders, combined with a special discount to participating governments, the circulation of the journals could not be increased. Before the end of the current year Council was engaged in deciding what new prices should be fixed and in investigating the idea of special departmental concession rates to contributing governments.

26. In September 1946 "Forest Products and Utilization" appeared separately as a quarterly publication. This is merely Section 3 of the "Forestry Abstracts" and deals with the whole subject of forest utilization and forest technology.

It was reprinted separately because that portion of the abstracts is of use to the forest trade and industry which would not usually be interested in the rest of the journal.

27. Nine Technical Communications were issued by the bureaux during the year—

	Issued by the Bureau of
Some British Books on Agriculture, Nutrition, Forestry and Related Sciences 1939–45.	All bureaux jointly.
Land Classification for Land Use Planning.	Soil Science.
The new Genetics in the Soviet Union.	Plant Breeding and Genetics.
The Use of Heterosis in the production of Agricultural and Horticultural Crops.	,, ,,
The Forage Resources of Latin America—El Salvador.	Pastures and Field Crops.
The Forage Resources of Latin America—Peru.	,, ,,
Fruit fall and its Control by Synthetic Growth Substances.	Horticulture and Plantation Crops.
Management Control in Selection Forest with particular reference to the application of the "Methode du Controle."	Forestry.
Gestation Periods.	Animal Breeding and Genetics.

In addition the Bureau of Soil Science issued a five-year Index—the "Bibliography of Soil Science, Fertilizers and General Agronomy, 1940–44."

28. The list above refers only to occasional publications issued by the bureaux. In addition to these and, of course, in addition to their regular periodicals, the Mycological Institute issued four papers on taxonomy and an Annotated Bibliography of Medical Mycology. The Bureau of Biological Control issued parts Numbered 7 and 8 of the Parasite Catalogue.

THE IMPERIAL INSTITUTE OF ENTOMOLOGY

29. The Director's Report is printed as Appendix II. In the calendar year 1939, the numbers of subscribers to series A and Series B of the Review of Applied Entomology were 664 and 475 respectively. During the war years the numbers fell, but in 1945 they recovered to 626 and 562 and in 1946 they increased to 837 and 696 respectively. The number of subscribers to the Bulletin of Entomological Research varied in a similar manner; in 1939 it was 407, it fell during the war years, in 1945 it rose to the pre-war figure and in 1946 increased to 520.

30. Despite printing difficulties, sales of all journals continue to increase and in the financial year under review the total net receipts were over £1,000 more than for the previous year, 1945–46. Sales of back numbers also continue to increase.

31. The number of specimens received for identification, which in pre-war years numbered 70,000 to 80,000 fell in the war years to 10,229, but in 1945–46 rose to 42,912 and in the year under review to 64,144. The number of entomologists from whom these specimens were received was 199 in 1945–46 and 142 in the year under review. The lists of identifications sent out totalled 300 comprising 6,254 names compared with 301 and 4,259 respectively in 1945–46.

32. The number of named specimens handed over to the British Museum was 17,325, of which 56 were types of species new to science and 437 were named species not previously represented in the National Collection. The numbers for the previous year 1945–46, were 3,817, 85 and 173 respectively. The number of insects presented to the British Museum by the Institute during its existence now amounts to 716,331, of which 7,316 are type specimens new to science and 13,549 species not previously represented. In addition, a number of specimens were presented to the Department of Zoology, University of Cambridge, and the National Museum of Wales, Cardiff.

33. The Library had many visitors during the year. Accessions were well maintained and the sets of many European periodicals published during the war years are now up to date.

IMPERIAL MYCOLOGICAL INSTITUTE

34. The Director's Report is published as Appendix III. Working conditions improved during the year and although the general work of the Institute increased, shortages in staff were not so acute and delays in printing were fewer. The Review of Applied Mycology achieved a new record number of subscribers. During the war the number of subscribers to the journal fell to 480, in 1945–46 the number rose to 724 and in the year under review the number was 831.

35. The increase in receipts from sales for all publications was well maintained, the figure £2,553 for the year under review being nearly £400 in excess of that for the previous year. Of the total figure more than half the amount

represents sales of back numbers the stocks of which are becoming exhausted. No volumes of the journal earlier than No. IX are available.

36. The intelligence services show similar increases. The circulation of the Supplements to the Review rose to a total of 146, being an increase of 22 over the figure for the previous year. Maps numbering 120 showing world distributions of plant diseases had been issued by the end of 1946. The number of subscribers rose to 232, being 17 more than in the previous year.

An Annotated Bibliography of Medical Mycology for 1945, prepared in conjunction with the Bureau of Hygiene and Tropical Medicine, was published during the year.

In addition to the above, occasional publications are issued under the title Mycological Papers. These now number 18, and the number of subscribers and receipts from sales have both increased.

37. Specimens and/or cultures of fungi for identification were received from 18 different countries and included some very interesting species. The number received during the year showed a substantial increase. Dr. Wiltshire acknowledges the valuable assistance received in identification from experts in the United Kingdom, Canada and the United States of America. The registering and cataloguing of specimens is progressing slowly, but the work involved is laborious and some additional staff is necessary to improve the rate of progress.

38. Major Dade and Mr. Mason continued their research work on certain fungi and Dr. Bisby was engaged on compilation and revision of lists of fungi and other mycological publications.

THE IMPERIAL BUREAU OF BIOLOGICAL CONTROL

39. No annual report for the year 1946–47 has been received. It will be incorporated in next year's report. Two important new projects were commenced during the year. The bureau was made responsible for the spruce budworm project at the request of the Canadian Government. This large and important undertaking necessitated the opening of a sub-station on the continent of Europe. The bureau was also asked to investigate the oyster scale which is doing very serious damage to the junipers in the island of Bermuda. This also necessitated work on the spot in the island of Bermuda.

40. In connection with the oyster scale project Dr. Thompson himself went to Bermuda a little before Christmas and remained until the close of the year. Arrangements were being made for an increase in his staff and soon after the close of the year G. C. Ullyett, B.Sc., M.D., was appointed and placed in charge of this Bermuda work thus relieving Dr. Thompson who returned to Belleville. Mr. Sellers was mostly working from Riverside, California, but arrived in Europe towards the close of the year to start the work on the spruce budworm project. Dr. Lloyd continued in Uruguay in charge of a group of miscellaneous problems and Mr. Simmonds remained in Trinidad.

41. The conference recommended that the staff should be increased by three entomologists (see page 59 of the Review Conference Report, 1946). Although the Review Conference period did not formally start until April 1, 1947, preliminary steps were in fact taken during the current year to recruit extra staff. As stated above Dr. Ullyett actually joined soon after the close of the year.

42. The Review Conference Report, paragraph 59, also recommended that the rates of pay of staff employed in North America should be in line with those for staff of comparable calibre in Canada. Preliminary work connected with this was started by the Executive Council soon after the publication of the report to enable the actual changes in rates of pay to be made from the beginning of the new review period. The revised rates of pay were in fact introduced from April 1, 1947, the beginning of the new period.

43. As already reported in paragraph 28 two parts of the Parasite Catalogue, Nos. 7 and 8, were published during the year.

POTATO COLLECTION

44. Dr. Hudson's report on the work in the calendar year 1947 is published as Appendix IV.

The Potato Collection, formerly known as the South American Potato Collection, forms the basis of an inter-Commonwealth scheme in potato breeding, using the South American potatoes collected in 1939, and since augmented from many other sources.

45. The Review Conference of 1946 considered that the collection is of great potential value to all countries of the Commonwealth and work upon it should be continued on a co-operative basis. The collection is large, numbering some 1,500 lines. Additional tuber and seed samples received during the year numbered 127 and 33 respectively. The numbers despatched were 519 tubers and 319 seed samples to Commonwealth countries overseas, and 82 tubers and 37 seed samples to foreign countries

viz., United States of America, Holland, Poland and Czechoslovakia.

46. The new insect proofed glasshouses and laboratory accommodation generously provided by the Nuffield Foundation have been in use for the whole year, enabling adequate precautions to be taken against virus spread. To permit of work on frost resistance being done properly, the Review Conference recommended that a suitable freezing chamber be installed (Review Copy, paragraph 85 (*b*)).

47. The sorting and testing of the various lines has continued and work is in progress on systematics, cytology, virus content and wart resistance, resistance to blight, eelworm, frost, etc.

48. The continued help given by Dr. G. Samuel of the Plant Pathological Laboratory, Harpenden, and Dr. C. Ellenby of King's College, Newcastle on Tyne, in testing for susceptibility to wart disease and eelworm attack respectively is much appreciated.

49. Dr. J. G. Hawkes made two visits to the continent of Europe to examine dried potato samples in connection with the preparation of a Bulletin of Potato Taxonomy. The first visit, in April, was to Germany, under the auspices of the British Intelligence Objectives Sub-Committee who paid the expenses and to whom Dr. Hawkes furnished a report on his return. The second visit, in the autumn, was to Switzerland and France. In July, Dr. W. R. S. Wortley attended the Fourth International Congress for Microbiology at Copenhagen.

50. Staff changes have been few. Mr. C. M. Driver left in June to return to New Zealand and in August Mr. K. Shepherd joined as junior botanist.

51. All contributions from governments due up to 31st March, 1947, have been paid.

FINANCE (EXCLUDING THE POTATO COLLECTION)

52. The Comptroller and Auditor General has audited and certified the accounts of the institutes and bureaux for 1946–47, and those of the Bureau of Biological Control for 1945–46. These accounts form part of this report and copies are attached to it.

The figures in the last column agree with those in the Auditor General's statements. Of the bureaux arrears outstanding on 31st March, 1947, all have since been paid except £142 15s. 1d. This is made up of £74 16s. 10d. from British North Borneo and £67 18s. 3d. from the Bahamas.

All arrears of the Institute of Entomology have since been paid except £50 from the Bahamas.

All arrears of the Mycological Institute have since been paid except £50 from the Bahamas.

The position on 31st March, 1947, was as follows:—

	£	s.	d.
Normal amount due in year ..	5,075	0	0
Deduct amount paid in advance in 1944–45 for 1945–46	6	10	2
	5,068	9	10
Add arrears outstanding on 31st March, 1945	74	19	1
Amount expected in the year ..	5,143	8	11
Deduct amount outstanding on 31st March, 1946	7	4	11
Contributions received in the year £	5,136	4	0

The accounts for 1946–47 have not been audited, but all payments due in the year have been received except £3 1s. 9d. from the Bahamas and £4 8s. 2d. from British North Borneo.

	Normal contributions due in 1946–47	Outstanding on 31.3.46, para. 37 of Report 1945–46	Total due	Deficit Outstanding on 31.3.47	Total received in 1946–47
	£	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Imperial Institute of Entomology ..	13,442	1,960 0 0	15,402 0 0	1,508 17 9	14,243 2 3
Imperial Mycological Institute ..	7,900	1,035 0 0	8,935 0 0	988 16 9	8,221 3 3
The Bureaux	44,000	894 12 11	44,894 12 11	2,192 13 6	42,967 17 9

53. The Audited Statement for the Bureau of Biological Control attached to this report relates to the year 1945–46. The position as regards contributions from Governments was as follows:

54. In last year's report it was recorded that for the year 1944–45 expenditure in the bureaux exceeded receipts by £6,572 8s. 2d. and balances on 31st March, 1945, were down to £4,086 16s. 11d.

Increased rates of contribution were introduced from 1st April, 1945. The financial position improved somewhat and for the year 1945–46 receipts exceeded expenditure by £4,693 4s. 5d. giving a balance on March 31, 1946 of £8,750 12s. 1d. This balance is a good deal lower than the minimum of 3 to 4 months expenditure previously laid down as a safe minimum. It should have been at least double that amount. During the current year 1946–47 the position has just about been maintained, the balance on March 31, 1947, being £8,039 2s. 5d. While this balance is well below the safe minimum for a yearly expenditure of £55,000, it is an entirely unsafe amount for the opening balance with an expenditure which is estimated to be £81,000 per annum (Review Conference Report, page 58). The minimum below which invested reserves should not fall should be at least £27,000 plus some further working balance.

J. G. ROBERTSON,
LT.-COL.
Chairman

THE EXECUTIVE COUNCIL OF THE IMPERIAL AGRICULTURAL BUREAUX

Account of Receipts and Payments for the year ended 31st March, 1947

RECEIPTS

	£ s. d.	£ s. d.	£ s. d.
*Balance on 1st April, 1946 ..			14,002 13 11
Contributions from Commonwealth Governments and Sudan:—			
Imperial Agricultural Bureaux ..	42,967 17 9		
Various Institutes	13,283 0 7		
		56,250 18 4	
Less: Paid over		13,450 18 11	
			42,799 19 5
Potato Expedition Fund			4,100 0 0
Contribution by Institutes towards cost of Headquarters			375 0 0
Miscellaneous Receipts:—			
Interest and Dividends ..	308 10 4		
Translation Fees, etc. ..	36 0 6		
			344 10 10
			£61,622 4 2

*Includes sums held on behalf of:—

Potato Expedition Fund ..	£7,064 11 1
Journal of Dairy Research ..	127 14 9

I have examined the above Account. I have obtained all the information and explanation that I have required, and I certify, as the result of my audit, that in my opinion the above Account is correct.

(Signed) F. N. TRIBE,
Comptroller and Auditor General.

PAYMENTS

	Expenditure £ s. d.	Less Receipts for Sale of Publications, etc. £ s. d.	Net expenditure £ s. d.
Expenditure incurred by the Imperial Bureau of:—			
Soil Science (Rothamsted) ..	4,604 18 2	1,482 6 10	3,122 11 4
Animal Health (Weybridge) ..	7,207 7 7	3,172 6 1	4,035 1 6
Animal Nutrition (Aberdeen) ..	5,204 14 8	113 7 1	5,091 7 7
Animal Breeding and Genetics (Edinburgh)	3,959 4 7	901 6 6	3,057 18 1
Pastures and Forage Crops (Aberystwyth)	8,790 9 4	1,132 3 8	7,658 5 8
Plant Breeding and Genetics (Cambridge)	5,407 7 11	1,177 13 10	4,229 14 1
Horticulture and Plantation Crops (East Malling)	3,883 12 0	1,245 5 10	2,638 6 2
Agricultural Parasitology (St. Albans)	1,811 12 7	569 17 2	1,241 15 5
Dairy Science (Shinfield)	3,363 19 10	707 9 7	2,656 10 3
Forestry (Oxford)	5,245 19 11	725 10 10	4,520 9 1
Secretariat	5,512 5 11	12 13 2	5,499 12 9
	54,991 12 6	11,240 0 7	43,751 11 11
Journal of Dairy Research ..			20 0 0
Potato Expedition Fund			5,180 0 10
I.A.B. Conference, 1946			479 8 0
Balance on 31st March, 1947.			
H.M. Paymaster General ..		15,687 4 8	
Less: Outstanding Orders ..	3,437 8 2		
Sub-Accountants and Deposit Accounts ..	1,843 5 7		
		5,280 13 9	
		10,406 10 11	
Add: Post Office Savings Bank		1,784 12 6	
			12,191 3 5†
			£61,622 4 2

Investments at 31st March, 1947.

£2,000 4% Commonwealth of Australia Registered Stock 1955/70 at cost £1,940 4 0

†Includes sums held on behalf of:—

Potato Expedition Fund ..	£5,984 10 3
Journal of Dairy Research ..	107 14 9

(Signed) E. J. ALLIES,
Accountant to Council.

(Signed) S. HOWARD,
Secretary,
Executive Council, Imperial Agricultural Bureaux.
14th October, 1947.

IMPERIAL INSTITUTE OF ENTOMOLOGY

ACCOUNT OF RECEIPTS AND PAYMENTS FOR THE YEAR ENDED 31ST MARCH, 1947

RECEIPTS

	£ s. d.	Amount £ s. d.
Balance on 1st April, 1946		9,508 8 1
Contributions from:—		
Commonwealth Governments	14,243 2 3	
Foreign Governments ..	375 0 0	
Societies	150 0 0	
		14,768 2 3
Interest and Dividends ..		510 11 5
Sales of Publications ..		5,068 10 9
		£29,855 12 6

PAYMENTS

	£ s. d.	Amount £ s. d.
Salaries, Directors		2,822 1 8
F.S.S.U. contributions		284 2 3
Salaries, Scientific Staff		8,116 16 6
F.S.S.U. contributions		640 7 3
Salaries, Librarian, Clerical Staff, etc.		3,710 18 1
F.S.S.U. contributions		367 17 5
Part time work		3 0 2
National Insurance		69 15 7
Travelling expenses		1 7 0
Library: Books, Publications, Binding, etc.		232 17 2
Bulletins		2,290 5 9
Stationery, Postages, Telephones, etc.		140 9 9
Rent, Rates, Insurance		369 17 10
Housekeeping: Light, Heat, Water, Cleaning, etc.		289 19 10
Laboratory Equipment		61 4 8
Contingencies		23 7 6
Audit Fee and Contribution towards Headquarters		250 0 0
Furniture		42 12 6
		£19,717 0 11
Balance on 31st March, 1947		
Joint Colonial Fund	9,000 0 0	
Crown Agents for the Colonies	905 15 8	
Dr. W. J. Hall	17 16 8	
	9,923 12 4	
Add: F.S.S.U. Suspense	214 19 3	
		10,138 11 7
		£29,855 12 6

Investments on 31st March, 1947	£ s. d.
£1,000 0 0 Cyprus 4% Stock 1956/66 at cost	950 0 0
£2,679 19 0 Funding 4% „ 1960/90 „ „	1,869 12 6
£1,000 0 0 Jamaica 4% „ 1952/62 „ „	940 0 0
£1,017 16 8 Kenya 4½% „ 1961/71 „ „	998 15 0
£1,000 0 0 India 4½% „ 1950/55 „ „	936 7 0
£1,000 0 0 Nigeria 4% „ 1963 „ „	881 7 0
£951 1 10 Savings Bonds 3% „ 1960/70 „ „	1,040 5 2
£8,648 17 6	£7,616 6 8

(Signed) E. J. ALLIES,
Accountant to Council.

(Signed) W. J. HALL,
Director.

I have examined the above account. I have obtained all the information and explanation that I have required, and I certify, as the result of my audit, that in my opinion the above Account is correct.

(Signed) F. N. TRIBE,
Comptroller and Auditor General.

(Signed) S. HOWARD,
Secretary, Executive Council,
Imperial Agricultural Bureaux, 22nd August, 1947.

IMPERIAL MYCOLOGICAL INSTITUTE: KEW, SURREY

ACCOUNT OF RECEIPTS AND EXPENDITURE FOR THE YEAR ENDED 31ST MARCH, 1947

RECEIPTS

	£	s.	d.
Balance on 1st April, 1946	9,300	1	1
Contributions:			
Commonwealth Governments	8,221	3	3
Societies	50	0	0
Dividends and Interest	183	8	7
Sale of Publications	2,802	0	11
Sale of Waste Paper	1	4	2
Refund of cost of War Damage repairs	15	4	7
Grant from Ministry of Supply	50	0	0
	£20,623	2	7

PAYMENTS

	£	s.	d.	£	s.	d.
Director's Salary				1,470	0	0
Superannuation				152	0	0
Scientific and Technical Staff Salaries				5,667	3	6
Superannuation				508	2	2
Clerical Staff Salaries				1,270	16	8
Superannuation				107	15	0
Laboratory Attendant				309	7	0
Superannuation				26	16	0
Part Time and Overtime				24	11	5
National Insurance				45	5	7
Travelling				10	3	6
Library				65	18	10
Publications				2,026	4	5
Postage, Stationery, Telephones, etc.				158	1	4
Rent, Rates, Insurance				135	3	9
Light, Heat, Water, Cleaning				299	11	7
Laboratory Apparatus				209	4	5
Contingencies				1	3	3
Audit and Contribution to Headquarters				120	0	0
Furniture				110	0	0
Visits overseas				73	17	2
				12,791	5	7
Balance on 31st March, 1947.						
Joint Colonial Fund	7,000	0	0			
Crown Agents for the Colonies	145	14	9			
Bank	519	7	1			
Petty Cash		3	6			
Stamps	7	8	10			
F.S.S.U. Suspense Account	160	9	10			
	7,833	4	0			
Less: Income Tax Suspense	1	7	0			
	7,831	17	0	7,831	17	0
				£20,623	2	7

(Signed) E. J. ALLIES,
Accountant to Council.

I have examined the above Account. I have obtained all the information and explanations that I have required, and I certify, as the result of my audit, that in my opinion the above Account is correct.

(Signed) F. N. TRIBE,
Comptroller and Auditor-General.

Investment at 31st March, 1947.

£2,077 15s. 4d. New Zealand 3½% 1960/64.

(Signed) S. P. WILTSHIRE,
Director.

(Signed) S. HOWARD,
Secretary,
Executive Council, Imperial Agricultural Bureaux.

3. 10. 47.

IMPERIAL INSTITUTE OF ENTOMOLOGY (PARASITE LABORATORY)

ACCOUNT OF RECEIPTS AND PAYMENTS FOR THE YEAR ENDED 31ST MARCH, 1946

RECEIPTS

	Canada	United Kingdom	Total
	$	£ s. d.	£ s. d.
Balance 1st April, 1945	16,592.36	3,711 18 9	359 9 6	4,071 8 3
Contributions from Governments of the Empire	5,573.84	1,250 0 0	3,886 4 0	5,136 4 0
Contributions for Special Projects ..	11,776.47	2,641 13 0	20 8 0	2,662 1 0
Rent of Farnham House			434 15 0	434 15 0
Sales of Publications	562.48	126 1 9	82 8 6	208 10 3
Interest—				
General Account ..			18 14 10	18 14 10
Capital ,, ..			3 9 1	3 9 1
*Remittances from the United Kingdom ..	16,391.00	3,700 0 0		3,700 0 0
	$50,896.15	£11,429 13 6	£4,805 8 11	£16,235 2 5

*Includes £700 in transit on 1. 4. 45.

(Signed) E. J. ALLIES,
Accountant to Council.

(Signed) S. HOWARD,
Secretary, Executive Council, Imperial Agricultural Bureaux.

3. 6. 47.

I have examined the above Account. I have obtained all the information and explanations that I have required, and I certify, as the result of my audit, that in my opinion the above Account is correct.

(Signed) F. N. TRIBE,
Comptroller and Auditor-General.

PAYMENTS

	Canada	United Kingdom	Total
	$	£ s. d.	£ s. d.
Directional Staff			
Superintendent ..	5,804.40	1,301 8 9	60 0 0	1,361 8 9
Superannuation ..	231.25	51 19 4	71 13 7	123 12 11
Scientific and Technical			
Assistant Entomologists	10,231.58	2,294 3 3	137 9 6	2,431 12 9
Superannuation ..			185 0 0	185 0 0
Clerical Staff ..	3,332.71	746 18 5	32 16 6	779 14 11
Laboratory Stewards	5,720.73	1,283 15 11	66 11 4	1,350 7 3
Superannuation ..			93 2 7	93 2 7
Laboratory Maintenance ..	2,301.73	516 8 1	61 6 3	577 14 4
			13 7 8	13 7 8
Rates			
Fire and other Insurances			39 19 0	39 19 0
				1,608 11 3
Travelling Expenses	7,165.56	1,608 11 3	
Freight and Postages	922.03	206 15 5	14 5 7	221 1 0
Library	14.95	3 6 10		3 6 10
Audit Fee			10 0 0	10 0 0
Publications	728.67	163 10 10		163 10 10
Net Loss by Exchange		7 5 2		7 5 2
	36,453.61	8,184 3 3	785 12 0	8,969 15 3
Remittances to Canada			3,000 0 0	3,000 0 0
Balances on 31st March, 1946.			
United Kingdom:			
Joint Colonial Fund			500 0 0	
Crown Agents for the Colonies:			
Capital Account			186 10 3	
General ,,			264 4 6	
F.S.S.U. Suspense			69 2 2	
				1,019 16 11
Canada			
Sundry Imprests ..	4,268.06		
Treasury	10,174.48		
	14,442.54	3,245 10 3		3,245 10 3
	$50,896.15	£11,429 13 6	£4,805 8 11	£16,235 2 5

APPENDIX I

(See Paragraph 10 of Report)

FOOD AND AGRICULTURE ORGANISATION OF THE UNITED NATIONS

Extracts from F.A.O. Publications

" F.A.O. Bulletin, Vol. II, No. 5 (October, 1947).

Review of Technical Work of F.A.O.

The Conference, through Commission II, conducted a thorough review of the technical activities of F.A.O. It was the first time that a Commission of the Conference devoted its full time to such a review. The Commission considered the programs and plans of each of F.A.O.'s technical divisions and discussed the projected 1950 world census of agriculture, forestry and fisheries. It also considered plans for the Rural Welfare Division.

The Commission felt that the largest possible part of the budget should be allocated to technical activities and recommended intensification of their regional development to make F.A.O.'s assistance more practical and useful to member nations. It urged the Director-General to continue action for suitable collaboration between F.A.O. and other international bodies concerned with related fields of activities, both to improve services through joint action and *to avoid duplication of effort.*"

" Second Annual Report of the Director-General to the F.A.O. Conference.

World Catalogue of Superior Breeding Stocks

A project touched on in the First Annual Report of the Director-General was the preparation and maintenance of a central catalogue of superior plant and animal breeding stocks as a source of information for breeders in all parts of the world. A preliminary meeting of a Sub-committee of the Standing Advisory Committee on Agriculture was held in Washington, 26th to 30th May, 1947, to discuss the project. The material significance of the problem may be gauged by two examples drawn from United States experience. An initial expenditure of $50,000 on exploration for soybean stocks between 1929 and 1932 has resulted in the years since then in the production of crops with a total value of several billion dollars. In the case of dates, the income taxes paid by growers in one year exceeded the money spent by the Division of Plant Exploration and Introduction since its inception 45 years ago.

The difficulties of carrying out such a clearing-house function as that proposed are obvious; for example, it would be impossible to assemble a complete list of the immense wealth of genetic material in the world. The sub-committee recommended that F.A.O. make a start by securing the co-operation of workers in appropriate research institutions and encourage the establishment of living collections of valuable stocks in their centres of origin. The sub-committee also stressed the harm that was being done by the setting up of artificial barriers to the free international exchange of plant and animal stocks, and recommended that F.A.O. point out to member governments the undesirability of restricting the free movement of genetic stocks upon which the improvement of world agriculture depends. Initial proposals were agreed to for the establishment by F.A.O. of a central catalogue of superior germplasm for the service of plant and animal breeders in all member countries."

" Report of the Second Session of the Conference—held at Copenhagen, Denmark, 2nd to 13th September, 1946.

Agriculture

2. Loss of Food through Infestation

Reports by F.A.O.[2] and by the Emergency Economic Committee for Europe[3] indicate that from 3 to 12 per cent. of the foods produced in the world as a whole are destroyed by insects, mites, rodents, bacteria, and mould fungi. This is equivalent to nearly one-half the foodstuffs entering into world trade. Recognising the gravity of this problem, the committee urges that the work of infestation control at present being carried on by E.E.C.E. in Europe be continued and furthermore, that similar measures be initiated in other regions.

It therefore recommends that F.A.O., in conjunction with governments and other organisations:

(1) Institute a world-wide survey to establish the main areas from which infestation springs, the channels through which it is carried from one country or area of the world to another, and the successful control measures currently being adopted.

(2) Develop the necessary organisation for disseminating information revealed by the initial survey and for keeping the information under constant review.

(3) Develop, according to location and class of commodity, the proper standards for safe and efficient storage.

(4) Frame, in due course, a compact and enforceable International Convention of Infestation Control and take steps to ensure, through the governments, that it is fully observed in practice and that organisations appropriate to the needs of the particular countries are developed.

(5) Establish immediate means for reducing infestation in international carriers, particularly merchant ships engaged in international trade, to prevent transmission of infestation to cargoes shipped " clean " and, through such cargoes, to the importing countries. (This is not so much a question of finding methods of disinfesting carriers as of ensuring that they are disinfested.)

(6) Consider, as an urgent matter, the question of transmission by aircraft of infestation likely to cause loss of or disease in commodities, crops and livestock, and settle upon preventive rules and the appropriate organisation to carry them out.

(7) Pending consideration of the general framework, agree that the European Infestation Control Working Party should continue to be responsible for promoting action in Europe and should deal within its region with the urgent question of transmission of infestation by aircraft.

(8) Encourage the formation of other regional groups with provision that representatives from the several regional bodies should meet and confer from time to time with a view to ensuring maximum co-operation and co-ordination.

(9) Urge that the periodic reports to be submitted by governments contain full information on the steps taken, the progress achieved, and the further measures contemplated for carrying out these recommendations."

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[2] Destruction of Food in Storage by Insects, Mites, Rodents and Mould Fungi (Nu/Wa WP 3), Washington, May 1946.

[3] Emergency Economic Committee for Europe, Resolution on Infestation Control Adopted (Nu/Wa WP 2), Washington, April 1946.

APPENDIX II

(see paragraphs 29–33 of Report)

IMPERIAL INSTITUTE OF ENTOMOLOGY
DIRECTOR'S REPORT FOR 1946-47

Two outstanding events have to be recorded for the year under review. (1) Dr. Sheffield A. Neave retired on the 31st July, 1946, after 29 years' service as Assistant Director, followed by 4 years as Director. The successful negotiation of the Institute's affairs during the difficult period of the later war years, and the first post-war year, must be attributed to his ability and wise guidance. He was responsible for building up the Publications Office almost from its inception, and the high standard of the Institute's publications is the direct result of his efforts. (2) A Commonwealth Agricultural Bureaux Conference was held in London in July, 1946, when the activities of the Institute were thoroughly examined, and estimates for its maintenance to cover the period 1947–52 were passed for submission to the contributing Governments for approval.

The year has been one of steady progress in all directions. The number of insect specimens sent in for identification, and of those actually determined, show an increase of about 50 per cent. on the previous year. Demands on the general information service have been maintained at a high level both from Government Departments at home and overseas, and, in addition, commercial firms and private individuals have made use of this service. Sales of publications reached a record figure and showed an increase of 25 per cent. over the corresponding figure for the previous year.

The administrative difficulties, caused by the scattered nature of the accommodation in which the staff of the Institute has to work, still remain. The need to secure adequate accommodation for the Publications Office in close proximity to the Natural History Museum was urged in the report of the 1946 Conference.

Staff

Dr. W. J. Hall, M.C., D.Sc., Assistant Director, was appointed Director on 1st August, 1946.

Dr. T. H. C. Taylor, D.Sc., Senior Entomologist, was appointed Assistant Director on 1st August, 1946.

Mr. S. C. Abbott was promoted Chief Clerk on 1st June, 1946.

Miss F. F. Scheffauer was promoted to Librarian on 1st April, 1946.

Miss E. M. Ralfs (Recorder) retired in June, after 28 years' service, on reaching the age limit.

Two new Abstractors were appointed during the year, and when the appointments approved by the Conference have been made the difficulties due to shortage of staff should be overcome.

Identification of Insects

During the year under review the number of specimens received amounted to 64,144, as compared with 42,912 in the previous year. These insects were sent in by 142 (199) different correspondents, who were geographically distributed as follows: Africa 54 (39), America 18 (13), Asia 15 (20), Oceania 12 (13), Europe 43 (114), all the numbers in brackets being those for the previous year.

The lists of identifications sent out totalled 300 (301), comprising 6,254 (4,259) names. The actual numbers of identifications sent to the various Dominions, Colonies and other territories are as follows:—

AFRICA:				
Union of South Africa	502	(69)		
Southern Rhodesia	133	(14)		
Sudan	341	(153)		
Gold Coast	93	(189)		
Kenya	1,262	(420)		
Nigeria	129	(105)		
Nyasaland	13	(18)		
Sierra Leone	93	(207)		
Tanganyika Territory	58	(17)		
Uganda	347	(520)		
Other Territories	876	(432)		
			3,847	(2,144)
AMERICA:				
Canada	—	(—)		
West Indies	148	(55)		
Other Territories	253	(215)		
			401	(270)
ASIA:				
India and Burma	479	(125)		
Ceylon	—	(18)		
Cyprus	—	(—)		
Malaya	—	(—)		
Palestine	486	(456)		
Other Territories	60	(159)		
			1,025	(758)
OCEANIA:				
Australia and New Guinea	318	(10)		
New Zealand	15	(179)		
Fiji Islands	188	(319)		
Solomon Islands	85	(43)		
Other Islands	22	(22)		
			628	(573)
EUROPE:				
United Kingdom	218	(494)		
Other Countries	135	(20)		
			353	(514)

In addition to the named specimens which are returned to the senders 17,325 (3,817) insects have been handed over to the British Museum, of which 56 (85) were types of species new to science, and among the remainder 437 (173) named species not previously represented in the National Collection. A number of specimens were also presented to the Department of Zoology, University of Cambridge, and the National Museum of Wales, Cardiff.

During the year 14 papers (266 pages) on insect taxonomy have been published by 8 members of the staff.

Publications

As a result of the fuel crisis printing difficulties were even more acute during the year under review than in 1945, and the new Abstractors will require some time before they are sufficiently trained to make their presence felt. The difficulty of getting even routine printing done up to time was greater than in any previous year. For these reasons it was impossible to keep either the matter, or the appearance of the individual parts, as much up to date as in pre-war years. For instance the last three parts of the 1946 volume of the Bulletin of Entomological Research were some months behind schedule. There are indications that the year 1947 will show a marked improvement.

In 1938 (see Report for 1938–39) some 18 tons of our publications were removed from Queen's Gate to the

Natural History Museum, whence we were asked to remove them in 1946 as the space was needed. Thanks to the kindness of the Museum authorities we were able to transfer these to Tring. In addition, we moved some 12 tons from Queen's Gate to ease the overcrowded accommodation.

Subscriptions and sales continued to rise sharply. Subscriptions increased by some 25 per cent. and total sales of back numbers showed an increase over the record figures of 1945.

Total net cash receipts for all journals during the financial year 1946–47 amounted to £5,068 10s. 9d. against £4,017 18s. 10d. for 1945–46, thus exceeding the previous year's record by over £1,000.

"Review of Applied Entomology"

The 34th (1946) volumes of the two series of the "Review of Applied Entomology" comprised 598 pages (exclusive of indexes) as against 610 (1945), and 1,287 abstracts and titles against 1,434 (1945).

Subscriptions to Series "A" increased from 626 (1945) to 837 (1946), and for Series "B" from 562 (1945) to 696 (1946).

Sales of back numbers amounted to £882 4s. 4d. against £1,041 17s. 6d. (1945).

Total cash receipts for the "Review" during the calendar year 1946 amounted to £2,781 13s. 4d. against £2,107 0s. 8d. for 1945.

"Bulletin of Entomological Research"

The 37th volume (1946) of this journal contained 632 pages against 512 in the previous volume. It comprised 44 papers, and was illustrated by numerous text figures and nine plates.

The number of subscribers rose from 407 (1945) to 520 (1946).

Sales of back numbers amounted to £705 14s. 0d. against £533 15s. 9d. in 1945.

Total cash receipts for the calendar year 1946 amounted to £1,711 8s. 2d. against £1,067 6s. 8d. for 1945.

"Zoological Record, part Insecta" Vol. 82 (1945)

Owing to printing difficulties this volume was not issued until March, 1947. The bulk of sales relating to it will, therefore, appear in the 1947 accounts.

Sales of back volumes showed a marked increase in 1946 amounting to £295 15s. 7d. as against £124 9s. 0d. for 1945.

The net profit to the Institute for the calendar year 1946 was £171 9s. 9d. as against £86 5s. 7d. for 1945.

The annual contribution of £100 to the Institute was received from the Zoological Society of London towards the cost of preparation.

Other Publications

Sales of "A Review of the Literature on Soil Insecticides" by Dr. H. C. Gough, published by the Institute in November, 1945, totalled 416 copies during 1946. 26 copies of "Locusts and Grasshoppers," 10 copies of "The Biological Control of an Insect in Fiji" and 4 copies of "The Coconut Moth in Fiji" were also sold during 1946.

The net cash received for these and other miscellaneous publications amounted to £229 2s. 2d. as compared with £61 10s. 5d. in the previous year.

Library

Accessions during the year numbered 297 (67) bound volumes and 933 (1,067) pamphlets, making a total of 11,479 volumes and 32,406 pamphlets. Exchange relations with the majority of our pre-war correspondents have now been resumed, and the sets of many European periodicals published during 1939–45 are up to date. Parts of 503 (401) serial publications were received during the year, the countries of origin being as follows (figures in brackets are for 1938–39):—

BRITISH EMPIRE:		
United Kingdom	49	(53)
Overseas	120	(172)
FOREIGN:		
Europe	126	(164)
Africa	19	(13)
Asia and Polynesia	7	(38)
United States and Territories ..	123	(127)
Central and South America ..	59	(24)

The decrease in the number of publications received from the overseas British Empire is largely due to the fact that many of the smaller colonies and territories ceased publishing reports and periodicals during the war, and have not yet resumed publication.

The author catalogue has been kept up to date for monographs and separates, and the catalogue of serial and official publications is also up to date. Arrears in cataloguing of bound volumes amount to 3,057; 112 books were catalogued during the year. Many enquiries on varied subjects were dealt with, and the small subject index to monographs has again proved useful. Many visitors have consulted books in the library, and outside loans numbered 1,267 as against 1,238 last year.

Co-operation with the National Central Library and other bodies has continued as before, and the Librarian is engaged in revising the entries relating to Institute holdings for the 3rd edition of the World List of Scientific periodicals.

The space problem is more acute than ever. To quote from the 1938–39 report ". . . it became necessary to transfer between six thousand and seven thousand volumes to the basement. . . . This necessarily gives rise to a highly inconvenient situation and one that is only tolerable in view of its temporary nature." Since then the stock has been distributed all over the building, and is now on four floors stretching from the top of the house to the basement. There is no room for expansion, and the present arrangements involve much waste of time and effort on the part of the library staff. There is no suitable accommodation for visitors who wish to study.

The resumed publication of the library lacunae list in the Review has resulted in several books being received, and among the donors may be mentioned the Medical Research Laboratory, Wad Medani, Sudan; the South-Eastern Agricultural College, Wye; Institut Français d'Afrique noire, Dakar; the British Council; Escola de Medicina Tropical, Lisbon, and the Gulf Research and Development Company, Pittsburgh, Pennsylvania. Special mention must be made of Professor E. N. Pavlovskii, President of the Russian Entomological Society, who has sent us many Russian publications that we had previously been unable to obtain.

APPENDIX III

(see paragraphs 34–38 of Report)

IMPERIAL MYCOLOGICAL INSTITUTE
DIRECTOR'S REPORT FOR 1946-47

Working conditions showed slight improvement during the year, incoming literature increased and for the first time for many months the Review of Applied Mycology appeared in its normal month of publication in January, 1947, though delays occurred immediately afterwards due to electricity cuts. The general work of the Institute continued to increase and necessitated additional clerical staff at the end of the year.

Investigational Work

Supplements 13 and 14 to the Review listing new species of fungi were compiled and issued during the year.

Dr. Wiltshire prepared for press a paper on " Species of Alternaria on Brassicae " for publication as a Mycological Paper.

Major Dade examined 21 samples of moulded stored products for the Ministry of Food.

Mr. Mason has continued his study on the Hyphomycetes with the assistance of Mr. Hughes and Mr. Ellis. They are concentrating on the species attacking wood and bark, including such pathologically important genera as *Helminthosporium*, *Brachysporium*, *Verticillium*, and *Stachylidium*. It has proved necessary to collect British material afresh in order to obtain accurate conceptions of the species and very considerable collections have already been made. The type species of the genera are receiving special attention. One paper is in preparation on the genus *Torula*, for which Mr. Hughes has made many drawings and it is hoped to publish this in 1947–48 as a Mycological Paper.

Dr. Bisby, in collaboration with Mr. T. Petch, formerly Mycologist to the Government of Ceylon, completed the compilation of a long, annotated list of the Fungi of Ceylon, which is now ready for the printer. The Ceylon Department of Agriculture propose to issue this as one of their Peradeniya Manuals but printing has been held up pending the necessary sanction.

Dr. Bisby also started a revision of the " Introduction to the Taxonomy and Nomenclature of Fungi " and of Ainsworth's and Bisby's " Dictionary of the Fungi." New editions of both these works will, no doubt, be needed in due course.

The list of medical fungi referred to in last year's report was circulated to interested workers overseas.

Miss Waterhouse commenced a survey of the genus *Phytophthora* with a view to the greater clarification of the species. Species of Pythiomorpha recently merged into the genus *Phytophthora* are being identified with known species of that genus where possible. *Pythiomorpha miyabeana*, an occasional parasite of rice seedlings, has proved to be *Phytophthora megasperma*.

Mr. Hughes in addition to his work on the Hyphomycetes completed and prepared for press three papers arising out of his investigations on sainfoin disease previously commenced while in the service of the Ministry of Agriculture and Fisheries. These papers deal with *Leptosphaeria nigrans*, *Ramularia onobrychidis* and *Septoria orobina*, respectively, and they are expected to appear in the *Trans. Brit. mycol. Soc.* in due course.

Mr. Ellis made good progress in the preparation of a monograph of the British species of *Periconia*. Over 300 specimens were examined; these were collected on various host plants throughout the year, so as to get a true picture of the natural variations of each fungus during its growing season. Work is temporarily held up pending the receipt of authentic material from New York and from Corda's Herbarium in Prague.

Mr. Ellis has commenced a detailed illustrated account of the type species of *Clasterosporium*, a genus which includes some important plant pathogens. The species involved grows on living leaves of *Carex riparia* and *C. acutiformis* and has hyphopodiate mycelium, a feature common to tropical fungi but rarely seen in this country.

Mr. Ellis also revised the smut collection and its host-index has been brought up to date.

Identification Work

During the year specimens or cultures have been received from Canada, India, Falkland Islands, Malta, Union of South Africa, Sierra Leone, Great Britain, Australia, Ceylon, Malaya, Kenya, New Zealand, Southern Rhodesia, Tanganyika Territory, and also from Holland, Italy, the Belgian Congo and the United States. Among the more interesting species of fungi received were the following: *Exobasidium vexans* on tea from South India, a new and serious pathogen to this territory where it is doing very considerable damage; a species of *Conidiobolus*, which may be new to science, attacking termites (*Coptotermes*) in Malaya, from Mr. Altson of the Rubber Research Institute, who thinks it might possibly provide a method of control of these very important insects: *Ramularia bellunensis* on pyrethrum from Kenya, where it caused a serious loss: *Gliomastix convoluta* on bottled plums from Great Britain: and *Alternaria gossypina* and *A. macrospora* on cotton from South Africa.

The cataloguing of the herbarium was actively continued during the year. Mr. Mason very kindly presented his private collection of Pyrenomycetes to the Institute and these specimens (about 1,200 in all) were registered and incorporated into the Herbarium. The total accessions registered during the year was 8,606 including about 4,000 new additions. This work is already proving its value in making readily accessible information about the specimens not hitherto available in the herbarium, but the labour is very great, and progress will be comparatively slow unless more staff is appointed to the work. For twenty-three years the specimens accumulated without being registered and it will take some years before the registration and cataloguing is completed.

About 30 cultures and collections of species of *Chaetomium* made in South Wales were very kindly presented to the Institute by Mr. Hughes and have been placed in the Herbarium. Many fresh collections of Pyrenomycetes were made by Mr. Mason, Mr. Hughes and Mr. Ellis, and have been added to the collections.

Preparation of Specimens for Exchange

Over two hundred substantial collections of specimens have been made for the purpose of exchange for material from other herbaria. In this way it is hoped to secure for the herbarium a considerable number of named specimens from other countries.

Visit of Mr. Mason to the Herb. Persoon at Leiden

As a result of a visit by the Director to Professor Lam at Leiden University some half-dozen specimens urgently required by Mr. Mason were very generously loaned to the Institute. Ultimately it was arranged for Mr. Mason to spend some six weeks at Leiden working over specimens of Hyphomycetes in the Persoon Herbarium.

The collection consists of more than 4,000 specimens which remain named as Persoon handed them over in 1829. No list has ever been published.

The normal work of determining fungi consists of identifying a specimen with its species and in the Persoon Herbarium profitable work turned entirely on the identification of a specimen as an authentic specimen. This involved considerable researches into the history of the collection and the recognition of the handwriting of Persoon and others. The experience gained has been of great help subsequently in interpreting collections already available to us at Herb. Kew. It has also provided a warning that collections being built up by the Institute were being insufficiently labelled.

Full details of 700 collections of Hyphomycetes were copied. Slides were prepared of all the material included in *Torula, Helminthosporium* and *Periconia.* The material of the most immediate use to Mr. Mason was authentic for *Torula herbarum, Hormiscium expansum, Alternaria tenuis, Helminthosporium nanum, H. simplex* and *Periconia byssoides.*

Mr. Mason had the valuable mycological assistance of Mrs. Mason throughout his visit, without whose help it would have been impossible for him to get through so very considerable an amount of work in so short a time. The fruits of the visit are of first importance to the investigations Mr. Mason has in hand and there is no doubt whatever of the very great value of the visit. It is hoped that similar visits to other herbaria may be possible in the future.

The general conclusion reached is that authentic material is available for some of the most important early species of Hyphomycetes, and that it is still usable even at this late time. There are, however, no specimens that can be indisputably designated as type specimens of these early names and mycology will have to get along as best it can in their absence.

The Institute has again had the valuable assistance of the following experts in the identification of species in various groups; Dr. Cummins of Purdue University, Dr. W. L. Gordon of Canada, Miss Wakefield and Dr. Dennis of Kew, Mr. G. Smith of the London School of Hygeine and Tropical Diseases and Mr. T. Petch.

Information Service

Review of Applied Mycology

Volume XXV of the Review contained 592 pages and 1,459 abstracts as against 512 pages and 1,310 abstracts for the preceding year. The Index for Volume XXIV contained 78 pages.

The number of subscribers at the end of the year was 831, an increase of 80 over the preceding year, which constitutes a new record. The total circulation was 1,098 copies, including 159 free and 108 exchanges.

Receipts from sales amounted to £2,553 3s. 11d. (of which approximately £1,450 represented sales of back numbers) as against £2,166 (for all publications) for the previous year.

The stocks of Volume I and XII were exhausted during the year so that no volumes earlier than Volume IX are available apart from copies returned as surplus from overseas departments or purchased.

In July, 1946, the "Common Names of virus diseases used in the Review of Applied Mycology" mentioned in last year's report was published as a special part (part 13) of Volume XXIV of the Review. The part was issued free to all current subscribers. The list has been favourably received and has already been adopted by Dr. Chamberlain in his list of plant virus diseases in New Zealand and by the Society of General Microbiology. It is hoped that it will assist in the standardization of virus names.

Supplements to the Review

The circulation of the Supplement reached a total of 146 by the end of the year, an increase of 22. Receipts from sales amounted to £59 4s. 4d.

Distribution Maps of Plant Diseases

Maps 97–120 and new editions of maps 6, 8, 9, 26 and 35 were issued during 1946. Mr. Hughes prepared these maps for the Press in addition to his identification work. The number of subscribers reached a total of 232, an increase of 17 during the year and receipts from sales amounted to £52 7s. 11d. as against £44 11s. 4d. for 1945–46. Covers for the maps are still not available owing to shortage of material.

Mycological Papers

Four papers were issued during the year. No. 15 by Mr. C. G. Hansford on "The foliicolous Ascomycetes, their parasites and associated fungi" was a notable contribution to which reference has already been made in earlier reports. The publication comprises 240 pages and 75 figures. A grant of £200 was received from the Parliamentary Grant in Aid of Scientific Publications administered by the Council of the Royal Society.

Other papers issued were No. 16 by B. B. Mundkur and M. J. Thirumalachar, "Revisions of and additions to Indian Fungi I"; No. 17 by G. Watts Padwick, "Notes on Indian fungi IV"; and No. 18 by B. B. Mundkur and Sultan Ahmad, "Revisions of and additions to Indian fungi II."

Receipts from sales of Mycological Papers amounted to £142 4s. 2d. against £41 8s. 6d., and the number of subscribers increased to 74.

Annotated Bibliography of Medical Mycology

The Bibliography for 1945 was published during the year. It consisted of 47 pages and comprised annotations of 224 papers with an authors' and general index. A grant of £15 was again received from the Honorary Committee of Management of the Bureau of Hygiene and Tropical Diseases and £32 5s. 10d. was received from sales, against £18 3s. 2d. in the previous year.

The bibliography of antibiotics was continued throughout the year but with the increase of incoming literature it became evident that the work could not continue indefinitely without further help being provided.

Library

About 260 books and reprints were lent during the year. Accessions, apart from periodicals, totalled about 21 books and 350 separates. No binding was done during the year. The compilation of a book catalogue was completed, and a special catalogue of scientific periodicals commenced. These catalogues are additional to the combined one in the Library.

Staff

In April, 1946, Miss G. M. Waterhouse was appointed Sub-Editor and M. B. Ellis, B.Sc., was appointed Assistant Mycologist.

Mr. L. M. Gall resigned his post of slavonic abstractor on the ground of ill health. Miss O'Onians, temporary herbarium assistant left on 30th September to enter the Imperial College of Science as a student. She was replaced by Mr. P. D. Hewett on September 9, 1946.

S. P. WILTSHIRE,
Director.

APPENDIX IV

(see paragraphs 44–51 of Report)

WORK ON THE POTATO COLLECTION CALENDAR YEAR 1947

supplied by

DR. P. S. HUDSON

General

The first complete year's work in the new laboratory and store buildings and the new glasshouses was carried out in 1947. Field plots were grown at Tynehead, Midlothian, Boxworth, Cambridgeshire, and at the Seale-Hayne Agricultural College, Newton Abbot, Devon. The use of a small Austin van on loan from the Ministry of Agriculture greatly expedited the field work and enabled more bio-chemical tests to be carried out than would otherwise have been the case.

Three new series of numbers, in addition to the E.P.C. sequence, have been formed, namely:—

(1) DC: *Domestic Collection*, comprising old potato varieties both from Britain and the Commonwealth and the newer foreign varieties of importance to plant breeders.

(2) BL: *Breeding Lines*. Promising breeding lines from various parts of the world which are not known under varietal names and so are not included in (1).

(3) MC: *Miscellaneous Collection*, of tuber-bearing species from South America (varieties of *Oxalis tuberosa*, *Ullucus tuberosus* and *Tropaeolum tuberosum*) and tuber-bearing Solanums not directly related to the potato section of the genus are included under this category, also any other specimens received by the Station.

1. Systematics. (Dr. J. G. Hawkes.) Sixty-seven lines of E.P.C. material have been classified botanically during 1947, and 198 seedling lines have been examined for trueness to parental type. Work on the taxonomic monograph of potato species has been continued. Two visits abroad were made to study type material in continental herbaria. In April visits were made to the herbaria of Hamburg, Bremen, Kiel, Göttingen and Munich. In October and November visits were made to Geneva, Lyons, Montpellier and Paris. The German tour was made under the auspices of the British Intelligence Objectives Sub-Committee.

2. Cytology. (Dr. J. G. Hawkes, Mr. K. Shepherd, assisted by Dr. A. Koppel.) Chromosome counts were made of 177 lines fixed in 1946 and 110 of the 391 samples fixed in 1947. The remainder of the 1947 fixations will be examined in 1948.

Work on a quick smear technique for mitotic chromosome counts has been undertaken and it is hoped to bring this into general use for the 1948 counts. The use of colchicine in doubling the chromosome number has been investigated. Tetraploids of one species have been produced and this work will be continued in 1948.

3. Virus Diseases. (Dr. W. R. S. Wortley, assisted by Dr. A. Koppel.) During the past season 426 recent accessions to the Collections have been tested for virus content by the usual methods, 44 per cent. being classed as healthy. Re-testing, and when necessary re-classification, was carried out on 264 diseased lines of which the virus content was doubtful or had not been checked for several seasons. Check tests were carried out on 345 domestic potatoes in connection with the investigation on the influence of virus diseases on the ascorbic acid content (see 1946 Report, paragraph 8). Together with tests involved in other experimental work, the total number of determinations of virus content amounted to over 1,400.

Further investigations have been carried out on unidentified viruses which occur in the Collections. Of five such viruses so far found one only, which has been destroyed, is known to be transmissible to domestic potatoes.

252 lines have been tested for resistance to virus Y by sap inoculation during the year and six types of response to this virus are now recognized. Of the 411 lines so far investigated, 10 (representing the following seven species, *S. tlaxcalense*, *malinchense*, *cardiophyllum*, *longipedicellatum*, *saltense*, *Rybinii* and *brevidens*) have shown strong indications of immunity to the virus. A selfed family of 48 seedlings from one of these (*S. malinchense*) has shown segregation with respect to susceptibility to virus Y.

A field-trial for leaf-roll resistance has been started on the Boxworth plot, two plants each of 460 lines having been interplanted with infector material kindly supplied by Mrs. McDermott of the Midland College of Agriculture and Mr. J. L. Hardie of the Seed Testing Station, Edinburgh. The results will become available when the tubers are grown again next year.

At the suggestion of Mr. Samuel of the Ministry of Agriculture and Fisheries, Plant Pathology Laboratory, a test was carried out on 19 important commercial varieties with the veinal necrosis virus of tobacco, an exotic strain apparently of potato virus Y, which is present in about 120 lines of the Collections. Under the glasshouse conditions the effects of this virus were invariably either extremely mild or entirely absent.

Dr. Wortley attended the Fourth International Congress for Microbiology at Copenhagen from 20 July to 26 July.

4. Wart Resistance. (Mr. G. Samuel, Ministry of Agriculture and Fisheries, Harpenden, Herts.) Unfortunately the 300 lines sent to the Ministry's laboratory in the winter of 1946–47 from the 1946 harvest were not tested. Another consignment of 202 lines was sent in September and a further set of 314 lines has been sent in December.

5. Blight Resistance. (Dr. M. A. Keay, assisted by Miss Lloyd (temporary) for 2 months in the summer.)

(i) Growth of *Phytophthora infestans* in artificial culture. One of the main difficulties in work on *Phytophthora infestans* is the maintenance of stock cultures especially during the winter months. Efforts to overcome this difficulty have met with partial success, as a medium which permits *P. infestans* to grow and spore in artificial culture has been evolved. This medium, however, is not entirely satisfactory since it is laborious to prepare and cultures growing on it require frequent sub-culturing. It is hoped that further study will overcome these disadvantages.

(ii) Reactions of tubers to *Phytophthora infestans*. The tuber reactions of 517 E.P.C. lines to strain A of *Phytophthora infestans* have been investigated. Only a few of these lines were found to have resistant tubers. Those of *S. Salamanii* (E.P.C. 23) are apparently resistant as are also those of *S. semidemissum* (E.P.C. 24), *S. longipedicellatum* (E.P.C. 28.2, 28.3 and 28.4) and *S. lanciforme* (E.P.C. 40.5, (40.6 × 40.7).1 and (40.6 × 40.7).2). The tubers of E.P.C. 23, 24, 28.3, 40.5 and (40.6 × 40.7).1 are also resistant to strain B of *P. infestans*. Different

clones of a species have been found to differ in their reactions to the fungus, for example, some lines of *S. semidemissum* are susceptible. Amongst the lines with susceptible tubers the rate of spread of the fungus differs considerably. In some lines the whole tuber rots rapidly whereas in others the rot advances but slowly. There are indications that the physiological state of the tuber tissue influences its reaction to *P. infestans* and this aspect requires further investigation.

(iii) Reactions of leaves to *Phytophthora infestans.*

A. A preliminary test showed that *P. infestans* spored more abundantly when inoculated on to leaves picked in the afternoon than when leaves were picked in the morning. All leaf inoculations, therefore, were carried out in the afternoon. The season's work has produced some evidence to show that a clone may differ in its reactions depending on whether it has grown under long or short day conditions and that reaction may be associated with age. In any one test some leaflets of a particular plant may become infected while others remain unaffected. These matters obviously require further investigation.

B. The leaf reactions to strain A of *P. infestans* of about 500 E.P.C. lines were examined. Examination of so many lines was made possible by the help of Miss Moira Lloyd of Kenya, who worked at the Empire Potato Station during the summer. Some of the above lines were also tested with strain B of *P. infestans.* Amongst the lines examined some appear to possess foliage resistance and it is hoped to reinvestigate these more thoroughly next season.

C. Of 276 lines received from Peru in 1946 the reactions of 103 to strain A of *P. infestans* have been tested. All lines so far examined have proved to be susceptible.

An examination has also been made of 193 breeding lines received from various sources. Most of these are apparently resistant but in several instances the inoculated tissues disintegrated very rapidly although no sporangiophores of *P. infestans* developed and reinvestigation is desirable.

(iv) Collection of strains of *Phytophthora infestans* for testing E.P.C. lines. With the co-operation of the National Agricultural Advisory Service, 41 specimens of blighted potato foliage were received from various parts of England and Wales during July–September. Sincere thanks are due to the Plant Pathologists of the N.A.A.S. for their willing assistance in this matter. Of the samples received it was possible to identify 35 of them on a series of resistant potatoes kindly supplied by Dr. Howard of the Plant Breeding Institute. The results of this work are proving useful in pointing the direction in which future tests should be pursued and it is hoped that it may be possible to collect further samples next year.

6. Rhizoctonia. (Dr. M. A. Keay.) All tubers received at the Empire Potato Station are surface sterilized for an hour in 1.1000 mercuric chloride. It has been found that this treatment does not kill the sclerotia of *Rhizoctonia Solani* and work is in progress to develop a satisfactory seed treatment.

7. Eelworm Resistance. (Dr. C. Ellenby, King's College, Newcastle-upon-Tyne.) 305 lines were sent to Dr. Ellenby for testing in 1947. The wild species *S. Ballsii* still shows great promise, exhibiting no formation of cysts on the roots. Detailed results of the 1947 tests have not yet been received.

8. Frost Resistance. (Mr. C. M. Driver.) No experimental work on frost resistance was done in 1947 since Mr. Driver left in June, and the work has not yet been continued owing to lack of special facilities (see 1946 Report). Plans are going forward to build a special frost chamber according to the recommendations of the Commonwealth Agricultural Bureaux Review Conference.

9. Biochemical Constitution. (Mrs. R. Morgensternova, assisted by Dr. A. Koppel and others.) The season's work consisted of the following tests:—

(1) Analysis of vitamin C content of 307 E.P.C. varieties in two replications with two plants in each sample.

(2) Analysis of change of vitamin C content in E.P.C. material during growth. Five E.P.C. varieties in two replications were harvested at weekly intervals during an eight-week period.

(3) Analysis of change in vitamin C content in four domestic potato varieties with four replications and 8–12 successive harvests at weekly intervals.

(4) Analysis of vitamin C in three batches of E.P.C. material grown under long and short day-length.

(5) Investigation of the effect of environment on vitamin C in one domestic variety grown at Tynehead and Cambridge.

(6) Dry matter estimations on material from all the above tests.

(7) Vitamin C and dry matter tests on some previous years' seedlings.

(8) Analysis of vitamin C in domestic varieties grown at Seale-Hayne by the kindness of the Seale-Hayne Agricultural College, Newton Abbot, Devon.

The detailed results of the biochemical experiments have not yet been worked out. This work has now been taken over by the Agricultural Research Council.

10. Crossability Survey. (Dr. J. G. Hawkes, Mr. K. Shepherd, Miss Lloyd (temporary).) A survey of the crossability of the wild and cultivated species was initiated this year and will be continued in 1948. This work was carried out both at Cambridge and in Scotland with the following results:—

	Crosses made	*Successes*	*Percentage Success*
Cambridge ..	378	45	11·9
Scotland	68	36	52·9
Total.. ..	446	81	18·1

A much higher percentage of successful crosses was obtained in Scotland and it is planned to continue this survey in Scotland as far as possible during the coming season.

To aid in interspecific hybridization the production of grafts between species that have so far proved impossible to cross was initiated this year and will be continued.

11. Seed Production. (Dr. J. G. Hawkes, Mr. K. Shepherd, Miss Lloyd (temporary).) Seed production was also much poorer in Cambridge than in Scotland during the hot dry summer of 1947. The following results were obtained:—

	Self-pollinations made	*Success*	*Percentage Success*
Cambridge ..	404	30	7·4
Scotland	82	26	31·7
Total.. ..	486	56	11·5

12. Tolerance of Soil Acidity. A collection of 22 lines was sent to Dr. W. Plant of the Research Station, Long Ashton, Bristol for testing for tolerance to soil acidity. Some promising results were obtained and a further 2 lines have been sent for test next season.

13. Field Work. (Dr. J. G. Hawkes, Dr. W. R. S. Wortley, Dr. M. A. Keay, Mr. K. Shepherd, Miss Ambrose

(i) At Tynehead Farm, Midlothian, Scotland. 541 E.P.C. lines, 63 domestic varieties and 145 hybrids and seedlings were planted at Tynehead making a total of 749 lines with about 1,600 plants. Much better growth was obtained than at Shothead the previous year, and the yields were also highly satisfactory. The plot was visited during the year, pollinations made, and notes taken on the growth. Samples of tubers were used for bio-chemical, blight resistance and other tests and for distribution.

(ii) At Boxworth, Cambridgeshire (by the courtesy of the Cambridgeshire War Agricultural Executive Committee). This plot was used for growing the material for bio-chemical tests already mentioned under 9 above, and for the leaf-roll infection experiment mentioned under 3 above. In addition, some pollinations were made and a row of samples for additional bio-chemical tests was grown.

14. Fourth International Congress of Microbiology, Copenhagen, July, 1947. Dr. W. R. S. Wortley attended the congress. The attendance was over 1,200 of whom about 850 were scientific delegates. Valuable liaison was established.

Potato material distributed during the period 1st January to 31st December, 1947:—

A. British Commonwealth—

Destination		*Tuber samples*	*Seed samples*
Australia	(Dr. Hutton) ..	66	—
,,	(Mr. Wenholz) ..	90	—
Canada	(Mr. Graham) ..	24	—
India	(Dr. Pushkarnath) ..	81	—
New Zealand	(Mr. Driver)	16	314
,, ,,	(Mr. M. A. Black) ..	3	—
South Africa	(Dr. van der Plank)	133	1
,, ,,	(Dr. Meyers)	—	1
Sudan	(Dr. Steven)	6	3
Uganda	..	100	—
Scotland	(Dr. Black)	3	—
,,	(Dr. Cockerham) ..	2	—
,,	(Dr. McIntosh) ..	15	—
,,	(Dr. Haigh)	7	—
,,	(Dr. Nelson)	4	—
N. Ireland	(Mr. Clarke)	1	—
England	(Mr. Samuel) ..	516	—
,,	(Dr. Ellenby) ..	305	—
,,	(Dr. Plant)	45	—
,,	(Mr. Horne)	1	—
,,	(Mrs. McDermott) ..	1	—
,,	(Mr. Cullen)	121	—
Total		1,540	319

B. Other Countries—

U.S.A.	(Dr. Mai, Cornell) ..	50	—
Holland	(Dr. Toxopeus) ..	—	23
Poland	(Dr. Jasnowski) ..	—	14
Czechoslovakia	(Dr. Jermoljev) ..	14	—
,,	(Dr. Macek) ..	18	—
Total	.. ..	82	37

Potato Material received 1st January to 31st December, 1947:—

A. British Commonwealth—

Source		*Tuber samples*	*Seed samples*
Australia	(Dr. Hutton) ..	5	—
South Africa	(Dr. van der Plank)	3	—
Scotland	(Dr. Black)	23	—
,,	(Mr. Hardie)	4	—
England	(Dr. Howard) ..	66	—
Total	.. .. ..	101	—

B. Other Countries—

Bolivia	(Dr. Cardenas) ..	—	15
,,	(Sr. O. Braun) ..	2	—
Costa Rica	(Sr. Orozco)	5	6
Crete	(via Greek Embassy)	1	—
Guatemala	(Dr. Stephens) ..	11	—
Holland	(Dr. Toxopeus) ..	4	12
San Salvador	(Dr. Stephens) ..	3	—
Total	.. .. ..	26	33

Non-potato material received:—

Peru	(Dr. Soukup) ..	—	3

ADDRESSES

The Executive Council,
2, Queen Anne's Gate Buildings,
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British Museum (Natural History), Cromwell Road, London, S.W.7.
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Important Notice—

From January 1, 1948, the name of this organisation was changed to "Commonwealth" Agricultural Bureaux. Consequently, all addresses appearing above use the new term "Commonwealth."

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